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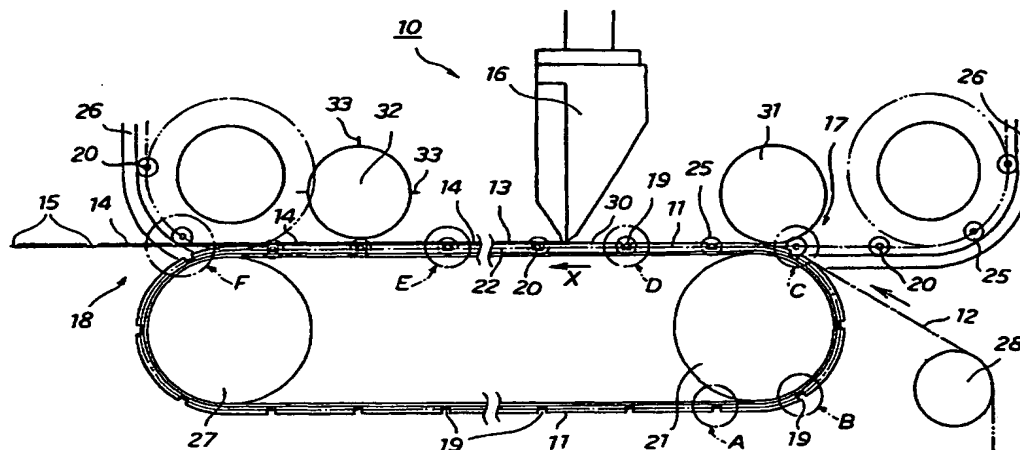
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(54) Title: **METHOD FOR INTERMITTENTLY FORMING LAID LAYERS**



(57) Abstract: An intermittently laying method for intermittently forming laid layers (14) comprising a fluidized substance (13) laid thereon on a surface of a sheet-like member (12) moving in one direction, in the moving direction, the method comprising steps of: folding a part of the sheet-like member (12) corresponding to a non-laid portion (15) between adjacent laid portions inwardly towards a back surface side of the sheet-like member (12) on an upstream side of a coating head (16) for laying the fluidized substance (13) on the sheet-like member (12) thereby forming a continuous surface-to-be-laid (30) on a surface side; continuously supplying the fluidized substance (13) from the laying means to the surface-to-be-laid thereby forming the laid layer (14); bringing back the inwardly folded non-laid portion (15) so as to be flush with the surface-to-be-laid (30) on a downstream side of the coating head (16); and intermittently interposing the non-laid portion (15) between continuously laid adjacent laid layers (14).

DESCRIPTION

METHOD FOR INTERMITTENTLY FORMING LAID LAYERS

Technical Field

This invention relates to an intermittently laying method and an intermittently
5 laying apparatus in which laid layers formed of a fluidized substance are intermittently
formed on a surface of a sheet-like member (basefilm).

Background Art

As a method for producing, on a mass production basis, products consisting of
rectangular flat bags with fluidized substance contained therein, the bags being formed by
10 sealing peripheral edge portions of a pair of top and back sheet-like members, there can be
contemplated a method, as shown in Fig. 4, in which laid layers 43 formed of a fluidized
substance are longitudinally and laterally arranged on an upper surface of a belt-like back
surface sheet 42 which is moved in one direction by a conveyor 41, while interposing non-
laid portions 44, a top sheet 45 is disposed in such a manner as to cover the laid layers 43,
15 thereafter, the back and top sheets 42, 45 are sealed together at the non-laid portions 44 and
then, the sealed portions are properly cut and divided.

As a method for disposing laid layers 43 formed of a fluidized substance on a band-
like back surface sheet 42, which is flowingly moved in one direction, while interposing
non-laid portions in the moving direction X, there can be contemplated, for example, a
20 method for intermittently providing the non-laid portions 44 by repeating the supply and
stop of the fluidized substance made by a coating head 46 at every predetermined time
interval. However, this method has such inconveniences that controlling of the coating
head 46 becomes complicated, the non-laid portion 44 is difficult to be interposed with
high degree of precision in accordance with the moving speed of the back surface sheet 42,
25 and production capability is not high.

It is an object of the present invention to provide an intermittently laying method
and an intermittently laying apparatus in which laid layers formed of fluidized substance

can easily be formed on a surface of a sheet-like member moving in one direction while intermittently interposing non-laid portions in the moving direction with high degree of accuracy and in which production capability can be enhanced.

Disclosure of Invention

5 The present invention has achieved the above object by providing an intermittently laying method for intermittently forming laid layers comprising a fluidized substance laid thereon in the moving direction, on a surface of a sheet-like member moving in one direction, the method comprising steps of:

10 folding a part of the sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of the sheet-like member on an upstream side of laying means for laying the fluidized substance on the sheet-like member thereby forming a continuous surface-to-be-laid on a surface side;

 continuously supplying the fluidized substance from the laying means to the surface-to-be-laid thereby forming the laid layer;

15 bringing back the inwardly folded non-laid portion of the sheet-like member so as to be flush with the surface-to-be-laid on a downstream side of the laying means; and

 intermittently interposing the non-laid portion between continuously laid the adjacent laid layers formed of the fluidized substance.

20 Also, the present invention has achieved the above object by providing an intermittently laying apparatus for intermittently forming laid layers comprising a fluidized substance laid thereon on a surface of a sheet-like member moving in one direction, in the moving direction, the apparatus comprising:

25 laying means for laying the fluidized substance on the sheet-like member; folding means disposed on an upstream side of the laying means and adapted to fold a part of the sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of the sheet-like member thereby forming a continuous surface-to-be-laid on a surface side; and unfolding means disposed on a downstream side of the laying means and adapted to bring back the inwardly folded non-laid portion of the sheet-like member, so as to be flush with the surface-to-be-laid.

30

The above "sheet-like member (basefilm)" is a thin and flexible member which can

easily be bent, but which can be restored to its original state after the bending state is released, preferably with such features that no trace of bending remains. For example, film, paper, cloth, woven fabric, nonwoven fabric and the like can be used as the sheet-like member.

5 As means for moving the sheet-like member in one direction, there can be used a continuous transferring device such as, for example, a belt conveyor and a top plate chain of either the belt or block type which can continuously transfer the supplied items loaded thereon.

10 The above-mentioned term "fluidized substance" includes those having such fluidity as being able to be supplied to the surface of the sheet-like member and shape retainability capable of retaining its shape when laid in the form of layer. For example, it may include not only paste-like or half-fluidized substance having viscosity but also powder-like or particle-like substance.

15 The above-mentioned term "laying (including it's conjugation)" means that the fluidized substance is disposed on the surface of the sheet-like member in the form of layer by supplying the fluidized substance to the sheet-like member through laying means. It includes such concepts as to coat the fluidized substance onto the surface of the sheet-like member, to provide the fluidized substance, which has been formed by extrusion molding or roll molding, in such a manner as to cover the upper surface of the sheet-like member, to
20 spray the fluidized substance onto the upper surface of the sheet-like member and so on.

Brief Description of the Drawings

Fig. 1 is a side view for explaining a construction of an intermittently laying apparatus according to one embodiment of the present invention;

25 Fig. 2(a), Fig. 2(b), Fig. 2(c), Fig. 2(d) and Fig. 2(e) are explanatory views showing several states in which a sheet-like member is folded inwardly towards a back surface side, Fig. 2(a) is an enlarged view of an A portion of Fig. 1, Fig. 2(b) is an enlarged view of a B portion of Fig. 1, Fig. 2(c) is an enlarged view of a C portion of Fig. 1, Fig. 2(d) is an enlarged view of a D portion of Fig. 1 and Fig. 2(e) is an enlarged view of an E

portion of Fig. 1;

Fig. 3 is an enlarged view of an F portion of Fig. 1 for explaining a state in which the sheet-like member is unfolded; and

Fig. 4 is an explanatory view for exemplifying a conventional method for manufacturing a product in which fluidized substances are received in a rectangular flat bag fabricated by sealing peripheral edge portions of a pair of sheet-like members.

Best Mode for Carrying Out the Invention

One preferred embodiment of the present invention will be described. An intermittently laying method and an intermittently laying apparatus according to the present invention are employed at the time when a sheet-like detergent package obtained by receiving detergent in the form of a dough as a fluidized substance in a flat bag having a rectangular configuration in a plan view which flat bag is formed by sealing peripheral edge portions of a pair of top and back sheets is produced on a mass production basis. A coated layer (laid layer) 14 formed of dough-like detergent 13 is intermittently formed on a surface of a belt-like back surface sheet 12 which is continuously supplied in one direction and is moved, as if flowing, by a conveyor 11 in the moving direction X, while interposing non-coated portions (non-laid portions), using an intermittently laying apparatus of Fig. 1. The term "dough" herein used refers to a kneaded mixture obtained by mixing and kneading a powder composition with a substance having fluidity such as paste, gel or the like as disclosed in Japanese Patent Laid-Open Publication No. Hei 10-204499. The substance having fluidity includes those which are fluidized by heating or being stressed.

After a top sheet is disposed on a surface of each coated layer 14 while interposing the non-laid portions 15, in the same manner as shown in Fig. 4 in the next process, the top and back sheets are sealed at the non-coated portions 15 and then, the sealed portion is properly cut and divided to thereby obtain a sheet-like detergent package which is a rectangular flat bag consisting of a pair of top and back sheets and containing dough-like detergent therein.

The dough-like detergent 13 of this embodiment is a paste-like detergent having fluidity and plasticity which can be coated onto the surface of the back surface sheet 12 through the coating head 16 serving as laying means. The dough-like detergent 13 has

viscosity and such shape-retainability that it is not collapsed nor flowed out and it can be held in the coated state which is in the form of a layer. The back surface sheet 12 and the top surface sheet are fabricated of a fiber sheet composed of, for example, polyvinyl alcohol fiber or various kinds of water soluble films. Accordingly, when a predetermined number of the sheet-like detergent packages obtained by cutting and individually dividing the sealed portions are put into a washing machine at a time of washing with the use of a washing machine, the top and back sheets covering the dough-like detergent 13 are dissolved rapidly to facilitate easy dissolving of the packaged dough-like detergent in the washing water.

10 The intermittently laying apparatus 10 of this embodiment includes the coating head 16 for coating the dough-like detergent 13 onto the back surface sheet 12, folding means 17 disposed on an upstream side of the coating head 16 and adapted to fold the back surface sheet 12 inwardly and unfolding means 18 disposed on a downstream side of the coating head 16.

15 The folding means 17 includes a plurality of pin insert grooves 19 each serving as a push-in groove formed in the surface of the conveyor 11 at a predetermined interval (for example, 70 mm) in a moving direction X of the back surface sheet 12 which is moved by the conveyor 11 and extending in a direction perpendicular to the moving direction X, a plurality of pin members 20 capable of movement at the same speed as the pin insert
20 groove 19 in the moving direction X and disposed such that the height of the center axis is brought to be generally equal to the center height of the pin insert groove 19 when it moves in the moving direction X and each serving as an insert member inserted along the pin insert groove 19, and an upstream side roll member 21 for making a change of direction of the conveyor 11 and guides it in the moving direction X. The function of the push-in
25 grooves can be constituted by, for example, arranging two narrow rods side by side, as far as there are two spaced edge portions for forming the push-in grooves for supporting the sheets and a space defined between the two edge portions of the push-in grooves. The edge portions of the push-in grooves are approached to each other to make the surfaces of the sheets substantially continuous when the fluidized substance is laid as later described.
30 The insert members serve to push a part of the sheet into between two spaced apart edge portions.

The pin insert groove 19 is, as shown in Fig. 2(a), formed in a surface of a belt body 22 of the conveyor 11 by arranging sponge plates 23 made of urethane having a thickness of 5 mm, for example, in a closely contacted relation with a gap of about 5 mm, for example, formed between the adjacent sponge plates 23 in such a manner as to have a width of 5mm and a depth of 5mm, for example, depending on the size dimension of the gap. The surface of each sponge plate 23 is covered with a protective film plate 24 composed of polyethylene terephthalate (PET) film having a thickness of 0.2 mm, for example, such that one end portion of the protective film plate 24 is expanded, as an edge portion, into a surface opening portion of the pin insert groove 19, thereby providing an opening width k of about 0.2 mm of the pin insert groove 19.

The sponge plate 23 has a soft material quality good enough to restrain its peel-off from the belt body 22 at the time of making a change of direction on the upstream side roll member 21. The protective film plate 24 has such resiliency that it can be deformed to the extent able to be inserted in the pin member 20 of the pin insert groove 19.

The pin member 20 is a round steel having a diameter of 3 mm, for example. The pin member 20 is provided on opposite ends thereof with a bearing 25 (see Fig. 1). On opposite sides with the conveyor 11 disposed therebetween, there are provided a pair of pin guide rails 26 which constitute a pin transfer system. By rollingly moving the bearings 25 along the pin guide rails 26, the pin members 20 can be moved in the moving direction X at the same speed as the conveyor 11 while maintaining the height of the center axis generally equal to the height of the center of the pin insert groove 19. The pin members 20 are arranged along the pin guide rails 26 at the same pitch (for example, 70 mm) as the pin insertion grooves 19. Accordingly, a plurality of the pin members 20 can be inserted in the respective pin insert grooves 19 in the moving direction X simultaneously.

The upstream side roll member 21 is a cylindrical member having a diameter of 125 mm, for example. The conveyor 11 is disposed between the upstream side roll member 21 and a downstream side roll member 27, as later described, and the conveyor 11 is turned endlessly at a predetermined speed by driving force of a driving motor. As shown in Fig. 2(b), when the conveyor 11 moving below is caused to make a change of direction upwardly, the upstream side roll member 21 enlarges the opening width k of the pin insert groove 19, i.e., the edges of the push-in groove are caused to move away from

each other depending on the curvature of the outer peripheral surface. In contrast, when the conveyor 11 is caused to move in the moving direction X from the outer peripheral surface, the opening width k of the pin insert groove 19 is reduced again so that the edges are caused to move towards each other (see Fig. 2(d)).

5 According to this embodiment, when the pin insert groove 19 located on the outer peripheral surface of the upstream side roll member 21 passes the outer peripheral surface so that the opening width k is brought from the enlarged state (see Fig. 2(b)) to the reduced state (see Fig. 2(d)), the pin member 20 is inserted in the pin insert groove 19 against resiliency of the expanded protective film plate 24 while sandwichingly retaining the back
10 surface sheet 12 which is continuously fed out from a sheet feed roll 28 (see Fig. 1). By doing so, a part of the back surface sheet member 12 corresponding to the non-coated portion 15 is folded inwardly towards the back surface side of the back surface sheet member 12.

15 When the back surface sheet 12 is folded into the pin insert groove 19 through the pin member 20, the enlarged opening width k between a distal end of the protective film plate 24 and the adjacent sponge plate 23 is reduced again as the pin insert groove 19 located at the outer peripheral surface of the upstream side roll member 21 moves in the moving direction X (see Fig. 2(d)). As a consequence, the edge portions of the pair of upstream side and downstream side of push-in grooves 19 are moved towards each other,
20 so that the folding edge portions 29 of the back surface sheets 12 are moved towards each other thereby forming a continuous surface-to-be-coated (surface-to-be-laid) for continuously coating the dough-like detergent 13 thereon from the coating head 16. As shown in Figs. 1 and 2(e), this surface-to-be-coated 30 is continuously coated with the dough-like detergent 13 coming from the coating head 16.

25 According to this embodiment, the pin members 20 are inserted in the pin insert grooves 19 in the state that the height of the center axis of each pin member 20 is brought to be equal to the center height of each pin insert groove 19. By properly adjusting the heightwise or crosswise position of the pin member 20 in the pin insert groove 19, the folding amount of the back surface sheet 12 sandwichingly held by the pin members 20
30 can be increased/decreased. Therefore, by doing so, the width of the non-coated portion

15, described later, can easily be adjusted. Such positional adjustment of the pin member 20 in the pin insert groove 19 can easily be made by properly controlling the relative position between the upstream side and downstream side roll members 21, 27 with the conveyor 11 disposed therebetween and pin guide rails 26 for guiding the bearing 25
5 mounted on the pin member 20. Also, the width of the non-coated portion 15 can easily be adjusted by varying the diameter of the pin member 20 to increase/decrease the folding amount of the back surface sheet 12.

According to this embodiment, a pin push-in roll 31 may be disposed above the upstream side roll member 21 in such a manner as to contact the conveyor passing an
10 upper end portion of the upstream side roll member 21. The back surface sheet 12 can smoothly be folded inwardly by pressing the pin member 20 with the pin push-in roll 31 thereby causing the pin member 20 to be inserted in the pin insert groove 19.

On the other hand, according to this embodiment, the unfolding means 18 includes the downstream side roll member 27 for making a change of direction of the back surface
15 sheet 12 from the moving direction X to the downward direction and tension applying means (not shown) for applying a pulling tension so as to pull the back surface sheet 12 in the moving direction X on a more downstream side than the downstream side roll member 27.

The downstream side roll member 27 is a cylindrical member, like the upstream
20 side roll member 21, having a diameter of 125 mm, for example. When the conveyor 11 moving in the moving direction X is caused to make a change of direction downwardly, the downstream side roll member 27 enlarges the opening width k of the pin insert groove 19 as shown in Fig. 3 by the curvature of the outer peripheral surface. And the pin member 20, which is continuously moving along the moving direction X is taken out of the pin
25 insert groove 19 so that the folded state of the back surface sheet 12 located at the non-coated portion 15 is released.

The tension applying means includes, among others, a feed roller (not shown) for feeding the back surface sheet 12 with the dough-like detergent 13 to the next sealing process, for example. Since the feeding speed is faster than the moving speed of the back

surface sheet 12 which is moved in the moving direction X by the conveyor 11, the back surface sheet 12 is pulled towards the downstream side in the moving direction X to thereby cause the fold-in edge portions 29, 29 of the back surface sheet 12 to be moved away from each other so that the non-coated portion 15 of the back surface sheet 12 is brought back so as to be flush with the surface-to-be-coated 30 (see Fig. 3).

According to this embodiment, on the upstream side of the downstream side roll member 27, there is a provision of a cutting roll 32 serving as cutting means which is located above the coated layer 14 formed by continuously coating the top surface of the back surface sheet 12. The cutting roll 32 is a cylindrical member of such a size dimension that the 1/4 length of its circumference is equal to the pitch length of the pin insert groove 19. The cutting roll 32 has cutters 33 projecting from the positions obtained by dividing the circumference into four. Each cutter 33 is located immediately above the pin insert groove 19 with the non-coated portion 15 of the back surface sheet 12 folded therein. The cutter 33 is cut into the coated layer 14 formed by continuously coating the dough-like detergent 13 onto the coated surface 30 at the location immediately above the pin insert groove 19, so that a cut line is formed therein. The cutting roll 32 is controlled such that the speed of rotation at its peripheral surface is equal to the moving speed of the conveyor 11 in the moving direction X and the four cutters 33 are sequentially cut into the coated layer 14 immediately above the pin insert grooves 19 which are arranged at a predetermined pitch, thereby forming the cut lines therein.

By preliminarily forming the cut lines in the continuous coated layer 14 on the upstream side of the downstream side roll member 27, even the dough-like detergent 13 having viscosity can easily be cut away towards opposite sides through the cut lines when the fold-in edge portions 29 of the back surface sheets 12 are moved away from each other while taking out the pin members 20 from the pin insert grooves 19. Therefore, it can easily be avoided that the dough-like detergent 13 is exposed to the non-coated portion and that the dough-like detergent 13 is adhered to the pin member 20 to soil it when the pin member 20 is taken out.

Cutter soil removing means (not shown) for cleaning the cutter 33 using a brush, a woven fabric, a nonwoven fabric, air or the like after the dough-like detergent 13 is cut, is

disposed adjacent the cutting roll 32. Also, pin soil removing means (not shown) for cleaning the pin member 20 taken out of the pin insert groove 19 using a brush, a nonwoven fabric, air or the like, is disposed adjacent the pin guide rails 26 on the more downstream side than the fold-in releasing means 18.

5 As another means for preliminarily forming a cut line in the continuous coated layer 14 at the location immediately above the pin insert groove 19 with the non-coated portion 15 folded therein, there are the following methods. Firstly, there is a reciprocating type cutting method in which the cut line is formed by moving the cutter up and down. There is also an equal speed reciprocating type cutting method in which the cut-in state of
10 the cutter with respect to the coated layer 14 is maintained for a predetermined time together with the moving speed of the coated layer 14 after the cutter is cut into the coated layer 14, so that a cut line can positively be formed. There is also a traverse type cutting method in which a cut line can be formed in the coated layer 14 by moving a cutter in the widthwise direction of the coated layer 14.

15 According to this embodiment, by using the intermittently laying apparatus 10 having the above-mentioned construction, the coated layer 14 formed of the dough-like detergent 13 can easily be formed on the surface of the belt-like back surface sheet 12 continuously fed in the moving direction X and moved by the conveyor 11, while intermittently interposing the non-coated portions 15 in the moving direction X. That is to
20 say, first on the upstream side of the coating head 16, the back surface sheet 12 located at the non-coated portion 15 is folded inwardly towards the back surface side of the back surface sheet 12 while inserting the pin member 20 in the pin insert groove 19, and the continuous surface-to-be-coated 30 is formed on the top surface side of the back surface sheet 12. Then, after the dough-like detergent 13 is continuously fed to the surface-to-be-
25 coated 30 from the coating head 16 to form the coated layer 14 thereon, the inwardly folded non-coated portion 15 of the back surface sheet 12 is brought back so as to be flush with the coated surface 30 on the downstream side of the coating head 16, so that the non-coated portions 15 are intermittently interposed between the adjacent coated layers 14 formed of the continuously laid dough-like detergent 13.

30 One pair of the coating heads 16 are disposed in adjacent relation in a direction

orthogonal to the moving direction X and the dough-like detergent 13 are coated on the back surface sheet 12 in two rows. By arranging the pair of coating heads 16 at a predetermined interval, a longitudinal non-coated portion 15 can easily be formed between the two rows of coated layers 14 along the moving direction X. By this, the coated layers are arranged in two rows on the back surface sheet 12, while longitudinally and laterally interposing the non-coated portions 15.

According to this embodiment, since the non-coated portions are intermittently interposed by repeating the folding and unfolding of the back surface sheet 12 along the flow of the back surface sheet 12 without a need of intermittently controlling the coating head 16 by repeating the supply and stop of the dough-like detergent made by the coating head 16 at every predetermined time interval and while maintaining the continuous supply of the dough-like detergent 13 made by the coating head 16, the coated layer 14 formed of the dough-like detergent 13 can easily be formed while intermittently interposing the non-coated portions in the moving direction X with a high degree of precision. Thus, production capability of the sheet-like detergent package can be enhanced.

It should be noted that the present invention should not be limited to the above embodiment and many changes and modifications can be made. For example, the present invention should not be limited to the dough-like detergent. Instead, the present invention can likewise be employed when other compositions such as semi-fluidized compositions, or compositions in the form of powder or particle are to be laid. Also, it is not absolutely necessary that the top surface side sheet-like member is disposed in such a manner as to cover the laid layer and the non-coated portions are sealed in the next process. In other words, those procedures in the next process may be employed only in accordance with necessity. A provision of the cutting means is not absolutely necessary, either. In addition, the folding means and unfolding means should not be limited to those of the above embodiment.

Industrial Applicability

According to an intermittently laying method and an intermittently laying apparatus of the present invention, a laid layer formed of a fluidized substance can easily be formed on the surface of the sheet-like member while intermittently interposing non-laid portions

in the moving direction with high degree of precision and thus production capability can be enhanced.

CLAIMS

1. An intermittently laying method for intermittently forming laid layers comprising a fluidized substance laid thereon on a surface of a sheet-like member moving in one direction, in the moving direction, said method comprising steps of:

5 folding a part of said sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of said sheet-like member on an upstream side of laying means for laying said fluidized substance on said sheet-like member thereby forming a continuous surface-to-be-laid on a surface side;

continuously supplying said fluidized substance from said laying means to said
10 surface-to-be-laid thereby forming said laid layer;

bringing back said inwardly folded non-laid portion of said sheet-like member so as to be flush with said surface-to-be-laid on a downstream side of said laying means; and

intermittently interposing said non-laid portion between continuously laid said adjacent laid layers formed of said fluidized substance.

15 2. An intermittently laying apparatus for intermittently forming laid layers comprising a fluidized substance laid thereon on a surface of a sheet-like member moving in one direction, in the moving direction, said apparatus comprising:

laying means for laying said fluidized substance on said sheet-like member; folding
20 means disposed on an upstream side of said laying means and adapted to fold a part of said sheet-like member corresponding to a non-laid portion between adjacent laid portions inwardly towards a back surface side of said sheet-like member thereby forming a continuous surface-to-be-laid on a surface side; and unfolding means disposed on a downstream side of said laying means and adapted to bring back said inwardly folded non-laid portion of said sheet-like member, so as to be flush with said surface-to-be-laid.
25

3. An intermittently laying apparatus according to claim 2, further comprising cutting means disposed on an upstream side of said unfolding means and adapted to form a cut line in said laid layer formed of said fluidized substance, which is continuously laid, at a portion immediately above said inwardly folded non-laid portion of said sheet-like
30 member.

4. An intermittently laying apparatus according to claim 2, wherein said folding means includes a plurality of push-in grooves extending in a direction perpendicular to the moving direction, a plurality of insert members which are moved in the moving direction at the same speed as said push-in grooves and are inserted along said push-in grooves when moving in the moving direction, and an upstream side roll member for guiding said push-in grooves in the moving direction, and wherein when said push-in grooves are brought from a state in which said push-in grooves are located at an outer peripheral surface of said upstream side roll member and an opening width of each of said push-in grooves is enlarged to a state in which said push-in grooves pass the outer peripheral surface and an opening width of each of said push-in grooves is reduced, said insert members are inserted in said push-in grooves while sandwichingly holding said sheet-like member which is continuously supplied, so that a part of said sheet-like member corresponding to said non-laid portion is folded inwardly towards a back surface side of said sheet-like member.

5. An intermittently laying apparatus according to claim 4, further comprising a function for adjusting a width of said non-laid portion by increasing/decreasing a folding amount of said sheet-like member sandwiched by said insert members, said folding amount being increased/decreased by adjusting the position of said insert members in said push-in grooves when said insert members are inserted in said push-in grooves.

Fig. 1

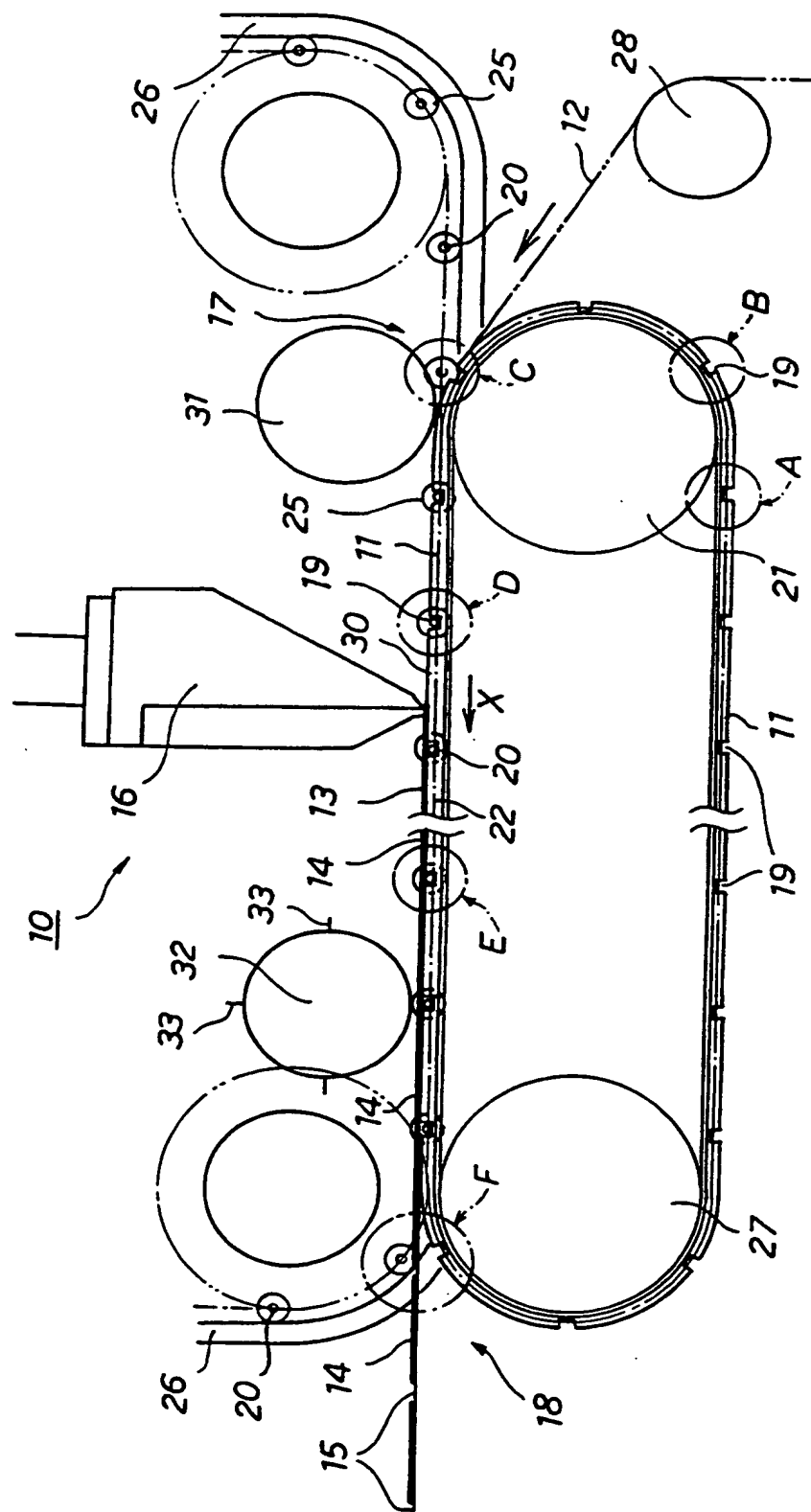
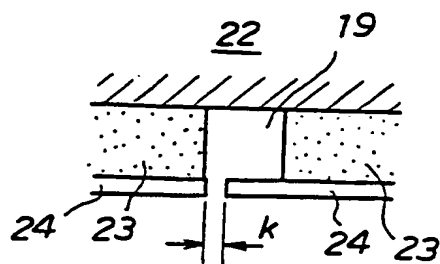
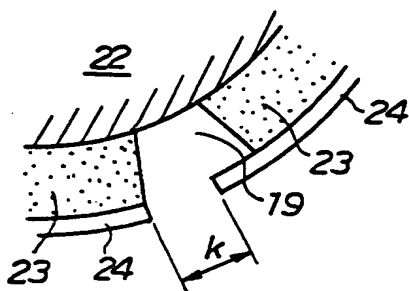
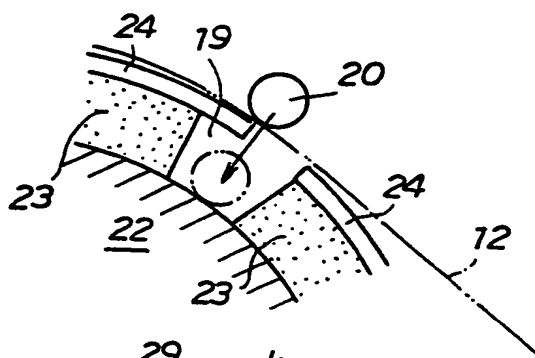
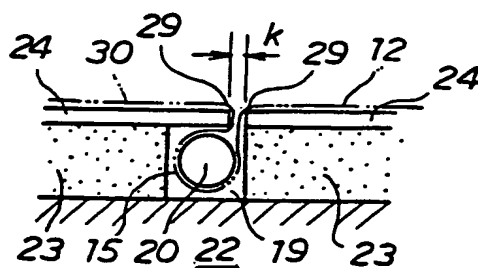
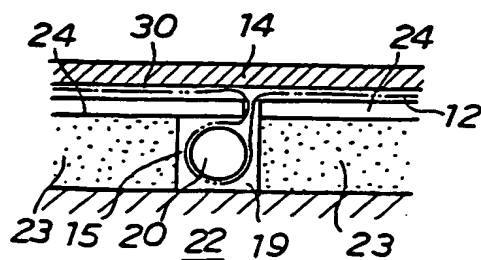
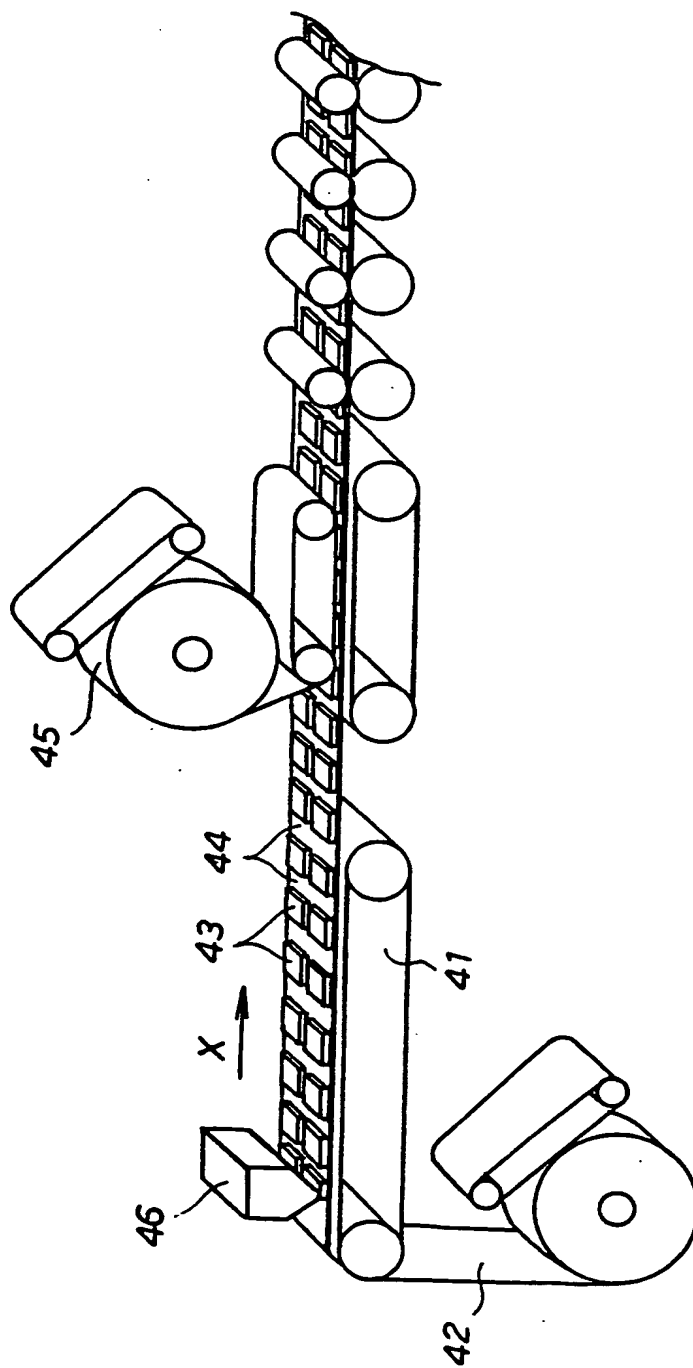


Fig. 2(a)**Fig. 2(b)****Fig. 2(c)****Fig. 2(d)****Fig. 2(e)**

**Fig. 4**

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P99-407	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/JP 00/ 03692	International filing date (day/month/year) 07/06/2000	(Earliest) Priority Date (day/month/year) 10/06/1999
Applicant KAO CORPORATION		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 02 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

METHOD FOR INTERMITTENTLY FORMING LAID LAYERS

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

01

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

JP 00/03692

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65B9/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 884 194 A (JOA) 6 December 1961 (1961-12-06) claims 1,17; figures 1,2	1,2
A	FR 2 155 515 A (MICHELI) 18 May 1973 (1973-05-18)	

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

4 September 2000

Date of mailing of the international search report

12/09/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Claeys, H

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

JP 00/03692

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 884194	A		GB 884191 A	
			GB 884192 A	
			GB 884193 A	
			GB 884195 A	
			GB 884196 A	
			GB 884197 A	
			GB 884198 A	
			GB 884199 A	
			GB 884200 A	
			GB 884201 A	
			GB 884202 A	
			US 3016582 A	16-01-1962
			US 3086253 A	23-04-1963
<hr/>				
FR 2155515	A	18-05-1973	IT 939934 B	10-02-1973
			BE 789642 A	01-02-1973
			DE 2248401 A	19-04-1973
			NL 7213444 A	09-04-1973
<hr/>				

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 00/03692

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 884194 A		GB 884191 A	
		GB 884192 A	
		GB 884193 A	
		GB 884195 A	
		GB 884196 A	
		GB 884197 A	
		GB 884198 A	
		GB 884199 A	
		GB 884200 A	
		GB 884201 A	
		GB 884202 A	
		US 3016582 A	16-01-1962
		US 3086253 A	23-04-1963
FR 2155515 A	18-05-1973	IT 939934 B	10-02-1973
		BE 789642 A	01-02-1973
		DE 2248401 A	19-04-1973
		NL 7213444 A	09-04-1973

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.



For Receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) P99-407

Box No. I TITLE OF INVENTION
INTERMITTENTLY LAYING METHOD

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Kao Corporation
14-10, Nihonbashi Kayaba-cho 1-chome,
Chuo-ku, TOKYO 103-0052 JAPAN

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (i.e. country) of nationality: JAPAN

State (i.e. country) of residence: JAPAN

This person is applicant
for the purposes of:

☐

all designated
States

☒

all designated States except
the United States of America

☐

the United States
of America only

☐

the States indicated in
the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KOBAYASHI Hideo
c/o Kao Corporation, Research Laboratories,
2606, Akabane, Ichikai-machi, Haga-gun,
TOCHIGI 321-3426 JAPAN

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box
is marked, do not fill in below.)

State (i.e. country) of nationality: JAPAN

State (i.e. country) of residence: JAPAN

This person is applicant
for the purposes of:

☐

all designated
States

☐

all designated States except
the United States of America

☒

the United States
of America only

☐

the States indicated in
the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf
of the applicant(s) before the competent International Authorities as:

☒

agent

☐

common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

7635 Patent Attorney HATORI Osamu
10129 Patent Attorney MATSUSHIMA Yoshiyuki
AKASAKA HKN BLDG. 6F, 8-6, Akasaka 1-chome,
Minato-ku, TOKYO 107-0052 JAPAN

Telephone No.

03-5570-1241

Facsimile No.

03-5570-1244

Teleprinter No.

☐

Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS	
<i>If none of the following sub-boxes is used, this sheet is not to be included in the request.</i>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> SAKAMOTO Masaki c/o Kao Corporation, Research Laboratories, 2606, Akabane, Ichikai-machi, Haga-gun, TOCHIGI 321-3426 JAPAN	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: JAPAN	State (i.e. country) of residence: JAPAN
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> OKUMURA Masahide c/o Kao Corporation, Research Laboratories, 2606, Akabane, Ichikai-machi, Haga-gun, TOCHIGI 321-3426 JAPAN	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: JAPAN	State (i.e. country) of residence: JAPAN
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> KAWAJIRI Hironobu c/o Kao Corporation, Research Laboratories, 2606, Akabane, Ichikai-machi, Haga-gun, TOCHIGI 321-3426 JAPAN	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: JAPAN	State (i.e. country) of residence: JAPAN
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i> (Empty)	This person is: <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality:	State (i.e. country) of residence:
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☐ **AP ARIPO Patent:** KE Kenya, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, DE Germany, DK Denmark, ES Spain, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|---|---|
| <input type="checkbox"/> AM Armenia | <input type="checkbox"/> MD Republic of Moldova |
| <input type="checkbox"/> AT Austria | <input type="checkbox"/> MG Madagascar |
| <input type="checkbox"/> AU Australia | <input type="checkbox"/> MN Mongolia |
| <input type="checkbox"/> BB Barbados | <input type="checkbox"/> MW Malawi |
| <input type="checkbox"/> BG Bulgaria | <input type="checkbox"/> MX Mexico |
| <input type="checkbox"/> BR Brazil | <input type="checkbox"/> NO Norway |
| <input type="checkbox"/> BY Belarus | <input type="checkbox"/> NZ New Zealand |
| <input type="checkbox"/> CA Canada | <input type="checkbox"/> PL Poland |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CN China | <input type="checkbox"/> RO Romania |
| <input type="checkbox"/> CZ Czech Republic | <input type="checkbox"/> RU Russian Federation |
| <input type="checkbox"/> DE Germany | <input type="checkbox"/> SD Sudan |
| <input type="checkbox"/> DK Denmark | <input type="checkbox"/> SE Sweden |
| <input type="checkbox"/> EE Estonia | <input type="checkbox"/> SG Singapore |
| <input type="checkbox"/> ES Spain | <input type="checkbox"/> SI Slovenia |
| <input type="checkbox"/> FI Finland | <input type="checkbox"/> SK Slovakia |
| <input type="checkbox"/> GB United Kingdom | <input type="checkbox"/> TJ Tajikistan |
| <input type="checkbox"/> GE Georgia | <input type="checkbox"/> TM Turkmenistan |
| <input type="checkbox"/> HU Hungary | <input type="checkbox"/> TT Trinidad and Tobago |
| <input type="checkbox"/> IS Iceland | <input type="checkbox"/> UA Ukraine |
| <input type="checkbox"/> JP Japan | <input type="checkbox"/> UG Uganda |
| <input type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> US United States of America |
| <input type="checkbox"/> KG Kyrgyzstan | |
| <input type="checkbox"/> KP Democratic People's Republic of Korea | <input type="checkbox"/> UZ Uzbekistan |
| | <input type="checkbox"/> VN Viet Nam |
| <input type="checkbox"/> KR Republic of Korea | |
| <input type="checkbox"/> KZ Kazakhstan | |
| <input type="checkbox"/> LK Sri Lanka | |
| <input type="checkbox"/> LR Liberia | |
| <input type="checkbox"/> LT Lithuania | |
| <input type="checkbox"/> LU Luxembourg | |
| <input type="checkbox"/> LV Latvia | |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☐
- ☐
- ☐
- ☐

In addition to the designations made above, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except the designation(s) of

The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

B x No. VI PRIORITY CLAIMFurther priority claims are indicated in the Supplemental Box ☐

The priority of the following earlier application(s) is hereby claimed:

Country (in which, or for which, the application was filed)	Filing Date (day/month/year)	Application No.	Office of filing (only for regional or international application)
item (1) JP	10.06.99	Patent Application No. 11-163976	
item (2)			
item (3)			

Mark the following check-box if the certified copy of the earlier application is to be issued by the Office which for the purposes of the present international application is the receiving Office (a fee may be required):

☒ The receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s): (1)
Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / EP

Earlier search Fill in where a search (international, international-type or other) by the International Searching Authority has already been carried out or requested and the Authority is now requested to base the international search, to the extent possible, on the results of that earlier search. Identify such search or request either by reference to the relevant application (or the translation thereof) or by reference to the search request.

Country (or regional Office): Date (day/month/year): Number:

Box No. VIII CHECK LIST

This international application contains the following number of sheets:

1. request : 4 sheets
 2. description : 12 sheets
 3. claims : 2 sheets
 4. abstract : 1 sheets
 5. drawings : 4 sheets

Total : 23 sheets

This international application is accompanied by the item(s) marked below:

1. ☒ separate signed power of attorney
 2. ☒ copy of general power of attorney
 3. ☐ statement explaining lack of signature
 4. ☐ priority document(s) identified in Box No. VI as item(s):
 5. ☒ fee calculation sheet
 6. ☐ separate indications concerning deposited microorganisms
 7. ☐ nucleotide and/or amino acid sequence listing (diskette)
 8. ☐ other (specify):

Figure No. Fig. 1 of the drawings (if any) should accompany the abstract when it is published.**Box No. IX SIGNATURE OF APPLICANT OR AGENT**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



HATORI Osamu



MATSUSHIMA Yoshiyuki

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority specified by the applicant: ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P99-407	<div style="display: flex; justify-content: space-between;"> <div> FOR FURTHER ACTION </div> <div> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) </div> </div>	
International application No. PCT/JP00/03692	International filing date (<i>day/month/year</i>) 07/06/2000	Priority date (<i>day/month/year</i>) 10/06/1999
International Patent Classification (IPC) or national classification and IPC B65B9/02		
Applicant KAO CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 18/10/2000	Date of completion of this report 06.03.2001
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Vesterholm, M Telephone No. +49 89 2399 2541



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/JP00/03692

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

Description, pages:

1-12 as originally filed

Claims, No.:

1-5 as originally filed

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/JP00/03692

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-5
	No: Claims
Inventive step (IS)	Yes: Claims 1-5
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-5
	No: Claims

- 2. Citations and explanations**
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item V

Reference is made to the following document:

D1: GB 884 194 A (JOA) 6 December 1961 (1961-12-06)

1. The closest prior art document D1 discloses following features of independent claims 1 and 2:

An intermittently laying apparatus and method for intermittently forming laid layers of a fluidized substance (18) on a surface of a sheet-like member (23) moving in one direction, said apparatus comprising laying means for laying said fluidized substance (18) on said sheet-like member (23) (see fig. 1 and 2, and page 2, lines 91 to 115).

The subject-matter of independent method claim 1 differs from D1 in that a part of the sheet-like member is folded below the surface-to-be-laid in order to have not-laid portions on the sheet-like member after the substance is laid on the surface-to-be-laid, and after the substance is laid on the surface-to-be-laid the folds are unfolded.

The subject-matter of independent apparatus claim 2 differs from D1 in that there are folding means for folding the sheet-member, and unfolding-means for unfolding the sheet-member.

The available prior art does not disclose such features as disclosed in claims 1 and 2 for producing parts which are free of the substance to be laid on the sheet-member. Furthermore, it would not be obvious for the skilled man in the art to derivate the features of claims 1 and 2 from the available prior art without involving an inventive step. Therefore, the subject-matter of independent claims 1 and 2 involves an inventive step in the sense of Article 33(3) PCT.

2. Claims 3, 4 and 5 are dependent on claim 2 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/JP00/03692

Re Item VII

3. Independent apparatus claim 2 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (see Item V, 1.) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT). Independent claim 2 should therefore be redrafted accordingly.

The independent method claim 1 should for the sake of clarity, stay in one part form comprising the method steps in chronological order.

4. Claims 1 to 5 do not contain any reference signs in parentheses as requested by Rule 6.2(b) PCT.
5. Although background art is disclosed in the application, no prior art document is cited (Rule 5.1(a)(ii) PCT).

Re Item VIII

6. The application does not meet the requirements of Article 6 PCT because of following reasons:
 - 6.1 The subject-matter of independent claim 1 is not clear. It is not clear from the wording of claim 1 that the folding of the sheet-member is done transversely to the moving direction of the sheet member.

Furthermore, the last part of the method claim, beginning "intermittently interposing said non-laid..." gives such an impression to the reader that this part is another step in the method. It however, appears to be a mere result of the previous step, beginning "bringing back...".

- 6.2 The description is in contradiction with the subject-matter of independent claim 1. The paragraph on page 11, lines 16 to 26, states that the substance to be laid on the sheet-member can be semi-fluidized or even in the form of powder. The wording of independent claim 1 defines the substance to be laid on the sheet-member to be fluidized material.